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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,824	08/21/2003	Yoshihiro Shiroishi	500.37488CC5	6177

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EXAMINER

CHEN, TIANJIE

ART UNIT PAPER NUMBER

2652

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/644,824

Applicant(s)

SHIROISHI, YOSHIHIRO

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/377,189.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20030821</u> . | 6) <input type="checkbox"/> Other: _____ |

Non-Final Rejection

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U. S. C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/377,189, filed on 08/19/1999.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crue et al (US 6,043,959) in view of Oka et al (US 5,494,722) and Han et al (US 6,024,886).

Claims 4 and 7, Crue et al shows a magnetic head for writing data at a high areal density (Column 1, lines 6-8) in a magnetic recording and reading device, and Oka et al show magnetic recording medium with low signal to noise ratio (Column 2, lines 13-15), which should fit in a device with high areal density. One of ordinary skill in the art would have been motivated to combine these two together to form a magnetic recording and reading device for working at a high areal densities. The above constructed device includes: a magnetic recording medium having a substrate (Column 2, line 65) and a magnetic layer formed on the substrate, a magnetic head comprising a recording head having a magnetic core having a magnetic core lengths of L1 and L2 not more than 35 μm (Column 12, lines 30-32), and an inherent R/W-IC;

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Oka shows in claim 1 that the magnetic layer contains (1) Co and Ni, (2) Cr and Ta, and (3) B, which is in an amount not more than 8 atomic % falling in the range of 0.1 to 15 atomic %.

Crue et al shows a reading head provided with a read element 112 (Fig. 14, column 7, line 65), but does not show that track width

Han et al shows a MR a track width of not more than 0.9 μm (Column 7, lines 40-42).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to apply the track width taught by Han et al into Crue et al's device. The rationale is as follows: Crue et al's device is used for high areal density. It is well known in the art that a narrow track width is important for high areal density recording and reading device. Han teaches a device with narrow track width. One of ordinary skill in the art would have been motivated to use this track width to reach high areal density in recording and reading.

Claim 9; Oka et al further shows in claim 1, that the magnetic recording medium further comprising a non-magnetic layer containing Cr.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crue et al in view of Oka et al and Han as applied to claim 4 above, and further in view of Tagawa (US 6,002,555) and Shirashi et al (US 5,995,329).

Claim 5, Crue et al further shows that a part of the magnetic core is formed by a magnetic film CoZrNb (Claim 4) and Tagawa shows it has a resistivity of 70 $\mu\Omega\text{cm}$ exceeding at least 50 $\mu\Omega\text{cm}$. Crue et al further shows a multilayer film having a magnetic film 94 and an insulating film 98, the magnetic head being inherently

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mounted on an integrated circuit suspension. Crue et al shows that the magnetic head has an inductance of $I_p = 10\text{-}20\text{ nH}$ (Column 7, lines 1-3). Shirashi et al shows that for a head mounted on a suspension, the total inductance $L = I_p + L_z$, wherein L_z is parasitic inductance of the circuit. For a conventional suspension, the parasitic inductance is $L_z = 20\text{ nH}$ (Column 2, lines 8-11). It would have been obvious at the time the invention was made to one of ordinary skill in the art to apply a conventional suspension into Crue et al and Oka et al's device, thus having $L = I_p + L_z = 40\text{nH}$, which is not more than 65 nH.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crue et al in view of Oka et al and Han as applied to claim 4 above, and further in view of Linliu et al (US 5,773,199).

In Crue et al's device, there is an inherent R/W-IC, but does not specify the linewidth.

Linliu et al shows a method for forming advanced integrated circuits, electrical element, and patterned layers of linewidth dimension at least as low as about 0.25 microns (Column 3, lines 5-8).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to apply Linliu's method Crue et al's device. The rationale is as follows: Linliu teaches that there has been a continuing trend towards decreasing linewidth dimensions (Column 1, lines 22-25) of electrical circuit element and patterned layers. One of ordinary skill in the art would have been motivated to apply Linliu's method to decrease linewidth to at least less than 0.25 microns, which is less than 0.235 microns.

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5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crue et al in view of Oka et al and Han as applied to claim 4 above, and further in view of Hayashi (US 6,090,480)

Claim 8, Crue et al shows magnetic layers, but does not show the crystallinity of the layer.

Hayashi shows a magnetoresistive device, which can be used for magnetic recording medium (Column 3, line 65 to column 4, line 2), wherein the magnetic layer contains amorphous material (Column 8, lines 2-6).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to add the amorphous material in the magnetic layer. The rationale is as follows: Hayashi teaches that the amorphous material is added as a MR enhancement material (Column 8, lines 2-6). One of ordinary skill in the art would have been motivated to add the amorphous material for enhancing MR effect.

Conclusion

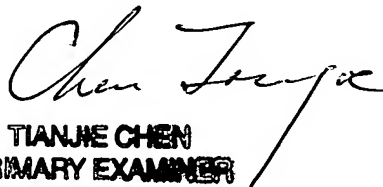
6. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TIANJIE CHEN
PRIMARY EXAMINER